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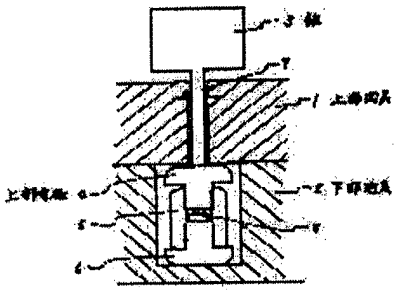
(54) SEALING JIG FOR SEMICONDUCTOR DEVICE

(57)Abstract:
PURPOSE: To eliminate the generation of the defective appearance of a glass section by constituting a sealing jig of a weight through which the contact area of an opening section in an upper jig and an upper electrode for a semiconductor device is reduced.
CONSTITUTION: A sealing jig contains a lower jig 2 into which a leadless type semiconductor device is inserted, an upper jig 1 with an opening section 7 in size of approximately one third of the area of an upper electrode 4 for the semiconductor device, and a weight 3 composed of a strut section inserted into the opening section 7 and a body section. The upper jig 1 organizing the sealing jig is brought to a high temperature at the same time as the lower jig 2 on sealing, the temperature of the semiconductor device is elevated, and a glass section 5 is melted. The weight 3 is brought into contact with the upper electrode 4 for the semiconductor device, and functions as the application of load to a pellet 8. Since the contact area of the opening section 7 in the upper jig 1 and the upper electrode 4 for the weight 3 is minimized at that time, the weight serves as the equalization of the temperature rise of the semiconductor device, the temperature gradient of the upper electrode 4 and a lower electrode 6. Accordingly, the contact state of the glass section 5 and the lower electrode 6 takes a shape that the inside is rounded slightly.



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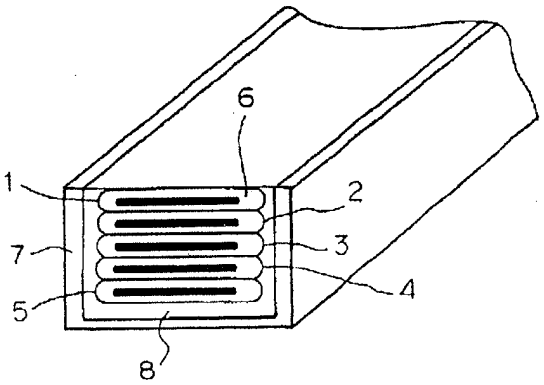
(54)【発明の名称】　酸化物超電導導体

(57)【要約】
【目的】本発明の目的は、電流リード導体に適した銀シース酸化物超電導導体を得ることにある。
【構成】ステンレスからなる補強材６の中に５本の銀シース酸化物超電導テープ線材１、２、３、４及び５をPb－Sn半田８で含浸した状態で格納した後、これを熱処理して各線材の銀シース６にPb－Sn半田８を拡散させてこれを合金化させ、銀シース６の熱伝導率を小さくする。



１～５：銀シース酸化物超電導線材、
６：銀シース、　７：補強材、
８：金属性接着座としてのPb－Sn半田

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【特許請求の範囲】

【請求項１】銀又は銀合金をシース材とする酸化物超電導導体において、前記シース材に金属性接着剤を拡散させてなることを特徴とする導体。

【請求項２】複数の導体が集合され、金属性接着剤で含浸されている、請求項１に記載の導体。

【発明の詳細な説明】

【０００１】

【産業上の利用分野】本発明は超電導コイル励磁用の電流リード導体に適した銀シース酸化物超電導導体に関するものである。

【０００２】

【従来の技術】酸化物超電導導体として、銀を複合材料として酸化物超電導体を覆い、臨界電流密度の向上と導体の熱的安定性を実現した導体が知られており、この複合導体を超電導コイル励磁用の電流リードとして使用する試みがなされている。

【０００３】

【発明が解決しようとする課題】ところが、銀をシース材とした酸化物超電導線材はシース材である銀の熱伝導率が低温部で非常に大きいため、銀シース線材では高温部からの熱の侵入に伴う液体ヘリウム等の寒剤の消費量が多く、電流リード導体としては余り好ましいとはいえない。

【０００４】本発明の目的は、かかる点に鑑み、電流リード導体に適した銀シース酸化物超電導導体を得ることにある。

【０００５】

【課題を解決するための手段】前記目的を達成するため、本発明では、酸化物超電導導体のシース材である銀に金属性接着剤を拡散させ、シース化された銀そのものの熱伝導率を低減させている。

【０００６】なお、各導体の酸化物超電導体としては、イットリウム系、ビスマス系、タリウム系その他多くの材料が使用できる。

【０００７】また、銀シース材料としては、銀に微量の

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Au、Cu、Mn、Ni、Ti等を添加した合金であっても差し支えなく、金属性接着剤としては、Pb－Sn半田、In半田等が使用できる。

【０００８】

【実施例】図面を参照して説明すると、図１は、銀シース酸化物超電導導体の集合導体の例を示している。

【０００９】この導体はステンレスからなる補強材７の中に５本の銀シース酸化物超電導テープ線材１、２、３、４及び５が収納され、Pb－Sn半田８で含浸された状態で格納され、各線材のシース６は夫々Pb－Sn半田８が拡散されて合金化している。

【００１０】銀シース６を合金化する方法としては、各線材１～５をPb－Sn半田８と共に補強材７の中に格納した後、その導体を熱処理する方法が採用される。

【００１１】このような構成の導体であれば、各線材のシース６材である銀がPb－Sn半田８の一部と合金化され、銀そのものの熱伝導率が低減される。

【００１２】

【発明の効果】本発明によれば、次のような効果が得られる。

【００１３】(1) 金属性接着剤と銀の合金化で銀の熱伝導率が小さくなり、超電導導体の低熱侵入性が向上するので、これを電流リード用導体として使用した場合、寒剤の消費量を低減することができる。

【００１４】(2) 金属性接着剤と銀の合金化により、シース材の高い抵抗かが実現され、交流モードでの使用に有利な導体となる。

【図面の簡単な説明】

【図１】本発明に係る酸化物超電導導体の一実施例を示す説明図。

【符号の説明】

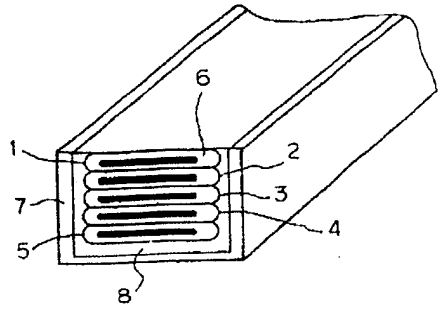
１～５　銀シース酸化物超電導線材

６　銀シース

７　ステンレス製の補強材

８　金属性接着剤としてのPb－Sn半田

【図1】



1～5：銀シース酸化物超電導線材、
6：銀シース、　7：補強材、
8：金属性接着剤としてのPb－Sn半田

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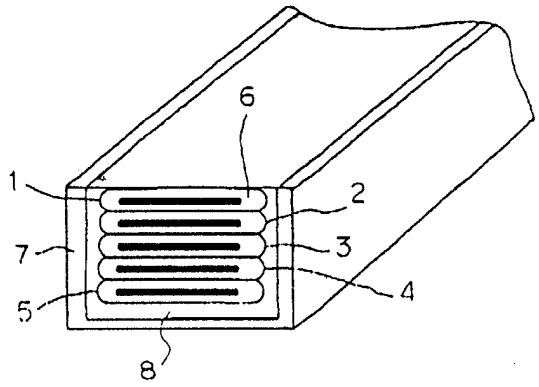
(54) [Name of the Invention] Oxide superconductor

(57) [Summary]

[Objective] The invention intends to obtain a silver sheathed oxide superconductor appropriate as a current lead conductor.

[Construction] In a reinforcing agent 6 made of stainless steel, 5 silver sheathed oxide super conductor tape wires 1, 2, 3, 4, and 5 impregnated with Pb-Sn solder 8 are housed; and this assembly is heated to diffuse the Pb-Sn solder 8 in the silver sheath 6 of each tape, creating an alloy and reducing the thermal conductivity of the silver sheath 6.



1 to 5: Silver sheathed oxide super conductor tape wires

6: Silver sheath 7: Reinforcing agent

8: Pb-Sn solder as a metal adhesive

[Claims]

[Claim 1] An oxide superconductor using silver or silver alloy as a sheath material characterized in that a metal adhesive is diffused in the seath material.

[Claim 2] An oxide superconductor according to Claim 1 in which multiple conductors are combined and impregnated with a metal adhesive.

[Detailed Description of the Invention]

[0001]

[Industrial Field of Application] The invention relates to a silver sheathed oxide superconductor appropriate as a current lead conductor for superconductive coil excitation.

[0002]

[Prior Art] An oxide superconductor is known in which an oxide superconductor is covered with silver as a composite material to improve the critical current density and thermal stability of the conductor; and this composite conductor is being tried as a current lead for superconductive coil excitation.

[0003]

[Problem Intended to be Solved by the Invention] The silver sheathed oxide superconductor is not quite appropriate as a current lead conductor because the thermal conductivity of silver as a sheath material is extremely high at low temperature, consuming a great deal of cooling agent such as liquid helium as heat infiltrates into the silver sheath from areas of higher temperature.

[0004] The invention intends to address this problem and offer a silver sheathed oxide superconductor appropriate as a current lead conductor.

[0005]

[Means to Solve the Problem] To achieve the objective above, the invention is designed to diffuse a metal adhesive in silver used as a sheath for oxide superconductor, reducing the thermal conductivity of the silver sheath.

[0006] An oxide superconductor may be selected from a number of materials including yttrium, bismuth, and thallium.

[0007] A silver sheath may be made of an alloy of silver and a small amount of Au, Cu, Mn, Ni, or Ti, while Pb-Sn solder or In solder is used as a metal adhesive.

[0008]

[Working Example] The invention will be described with reference to a figure; Figure 1 is an example of a silver sheathed oxide superconductor incorporating a set of conductors.

[0009] The conductor is composed of 5 silver sheathed oxide superconductor tape wires 1, 2, 3, 4, and 5 impregnated with Pb-Sn solder 8 and housed in a reinforcing agent 7 made of stainless steel; and the Pb-Sn solder 8 is diffused in the sheath 6 of each wire, resulting in an alloy.

[0010] To alloy the silver sheath 6, the wires 1 to 5 are housed with the Pb-Sn solder 8 in the reinforcing agent 7, and this assembly is heated.

[0011] In the conductor thus constructed, silver in the sheath 6 of each wire is alloyed with part of the Pb-Sn solder 8, reducing the thermal conductivity of silver itself.

[0012]

[Effect of the Invention] The invention achieves the following.

[0013] (1) Alloying a metal adhesive with silver reduces the thermal conductivity of silver and enhances infiltration of a superconductor at low temperature; the conductor, when used as a current lead conductor, minimizes consumption of a cooling agent.

[0014] (2) Alloying a metal adhesive with silver produces high resistance of the sheath material, resulting in a conductor effective for alternate current.

[Brief Description of the Figure]

[Figure 1] An oxide superconductor according to the invention, a working example.

[Key to figure]

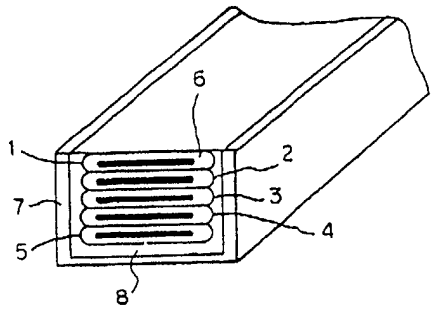
1 to 5: Silver sheathed oxide super conductor tape wires

6: Silver sheath

7: Reinforcing agent

8: Pb-Sn solder as a metal adhesive

Figure 1



1 to 5: Silver sheathed oxide super conductor tape wires

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